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ORIGINAL ARTICLE

The prevalence and practice impact of weight bias amongst Australian dietitians

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Summary

Objectives

This study explored weight bias amongst Australian Accredited Practising Dietitians (APDs) and the effect of client weight status on dietetic practice.

Methods

Participants were 201 APDs, recruited using purposive sampling. A self-administered questionnaire, the fat phobia scale (FPS), was completed to assess explicit weight bias. Participants were then randomized to receive either a female within the healthy weight range or female with obesity, accompanied by an identical case study for a condition unrelated to weight. Participants assessed the client based on data provided, provided recommendations and rated their perception of the client.

Results

Mean FPS scores indicated mild fat phobia. However, dietetic practice was significantly affected by the client's weight status. Dietitians presented with the female with obesity assessed the client to have significantly lower health and were more likely to provide unsolicited weight management recommendations. In addition, dietitians rated the client as less receptive, less motivated and as having a lower ability to understand and sustain recommendations.

Conclusions

The contribution of this study is the exploration of how weight status may impact dietetic practice including assessment, recommendations and perceptions of the client. Dietitians may practice in a manner that represents or could be perceived as negative implicit weight bias, despite the explicit FPS assessing only mild fat phobia. Further research to understand the extent of the problem and how it impacts client outcomes and to test possible solutions is required.

Keywords: Dietetic practice, dietitian, fat phobia, weight bias, obesity.

Introduction

More people in developed countries such as Australia (63.4%) (1) and the United States of America (68.8%) (2) are classified as within the overweight or obese range than those classified within the healthy weight range. The negative personal and public health impacts of obesity are well understood, and addressing this issue is now a priority, attracting significant resources (3–5). Increasing evidence is suggesting that the global focus on obesity may be harmful for some, reinforcing weight bias (6). Weight bias is where a person holds a negative attitude towards, prejudice against or associates stereotypes towards a person because of their weight. Despite larger body sizes being 'normal', a number of studies have identified that weight bias has increased alongside the rising obesity rates (7–10).

Along with negative effects on employment opportunities, personal relationships and educational attainment (11), health markers such as cortisol reactivity (12), central adiposity and glycemic control (13), weight discrimination has been shown to increase caloric intake and reduce

dietary control in overweight women (yet do the opposite in non-overweight women) (6) and reduce self-rated health (14). People with obesity may also internalize negative societal messages and are at higher risk of developing depression (15).

Most people with obesity report having experienced weight bias at the hands of healthcare practitioners (16), and this can have negative consequences (17). Weight bias may develop early in dietetic training and professional socialization. In Puhl, the study of Wharton and Heuer (2009), they found that students believed that clients with obesity had poorer diet quality and poorer health status, even when clients presented with identical dietary, medical and biomedical information (10). The students also believed that clients with obesity would be less likely to comply with treatment when compared with people in the healthy weight range. Another study found that approximately 16% of dietetic students had high levels of weight bias (18).

Weight bias has been reported in other healthcare practitioner groups (16) including those specializing in obesity management, where adjectives such as 'lazy', 'stupid' and 'worthless' were associated with people with obesity (17). In one study, it was reported that 45% of physicians held negative views of patients affected by obesity (19). In another, medical students treating a patient for gastrointestinal disorders did not believe the patient with obesity would be able to make the lifestyle changes necessary to improve their gastrointestinal symptoms nor that they would comply with dietary recommendations or be responsive to counselling (20–22). They also rated the person affected by obesity as less attractive and more depressed than people of healthy weight. Hebl, Xu and Mason (2003) found that physicians treated clients with obesity very differently to those of a healthy weight (19), including ordering more tests and providing less consultation time. This did not go unnoticed, and patients in this study perceived physician's attitudes to be negative and displaying distancing behaviour (16). However, in a study of bariatric surgery candidates with a mean body mass index (BMI) of $48.2 \pm 7.5\ \mathrm{kg\,m^{-2}}$, Sarwer *et al.* (2008) found that their participants were subjected to very little weight bias (23). Their research did identify that those subjected to greater incidences of weight bias had higher symptoms of depression and lower quality of life. These studies suggest that weight bias amongst healthcare practitioners may impact on the level of, and type of, care provided by the practitioner, and the interactions clients have with their healthcare provider.

Dietitians perceive that they are the most equipped primary healthcare professionals to help individuals manage their weight (24). However, they are not immune to weight bias, with one study showing that dietitians believed people with obesity were personally responsible for their excess weight and that people with obesity had lower self-esteem, lower attractiveness and lower levels of health (25). The patient–client relationship is vital to improving client outcomes from prevention through to treatment and management (26). Dietitians report frequently experiencing frustration with their clients affected by obesity because they perceive that some show unrealistic expectations for weight loss results, combined with poor compliance, motivation and lack of commitment to losing weight (25). These negative attitudes and emotions may negatively affect the patient–client relationship.

Stigmatized individuals are considered a vulnerable group who face more barriers in attending healthcare practitioners (16,27). Individuals who are overweight, regardless of personal self-esteem, are likely to delay, cancel or avoid visits to healthcare practitioners whom they believe hold negative weight biases (16). Of particular importance to dietitians, it has been shown that women with obesity may delay or avoid visits to healthcare professionals due to fear of being told to lose weight, the embarrassment of having to undress, being weighed or being given unsolicited weight loss advice (16). This may impact client outcomes, as it is known that those who have more frequent appointments with their healthcare provider are more likely to achieve positive outcomes (28). Clients affected by obesity may perceive they may face weight bias, even if their consultation purpose is not weight-related, and therefore choose not to consult a dietitian for their non-weight-related health concerns.

The initial part of this study aimed to examine whether Australian APDs possess a weight bias similar to previously reported dietetic and dietetic student populations as assessed by fat phobia scale (FPS). The subsequent part of this study tested two hypotheses. First, we hypothesized that client weight status would influence patient care including perception, assessment and recommendations. Second, we tested the hypothesis that the picture of a female affected by obesity would prime more negative responses from APDs than the picture of a female within the healthy weight range, in relation to their attitude towards working with the patient.

Materials and methods

Participants

Data were collected via an online questionnaire using a purposive sample of Australian APDs invited to participate through email list serve for private sector interest groups managed by the Dietitians Association of Australia (DAA) after approval from the Central

Queensland University Human Research Ethics Committee (H11/05-080). At the time of data collection, the invitation had the potential to reach 1,222 dietitians. Results were included for participants who completed the questionnaire in its entirety. Of the 215 that completed the questionnaire, 201 (95%) were eligible to be part of the study. We do not have access to information on the number of potential participants who opened the email invitation. If all opened the email, the response rate would be 17.6%.

Materials

The 14-item FPS (27) is a measure of a person's attitude towards people with obesity and uses a five-point Likert scale between competing terms where subjects choose a number closest to the adjective they believe most closely describes people with obesity (22). The short form was found to be reliable (Cronbach's alpha 0.87 and 0.91 for two different samples) and highly correlated with the original scale ($r = 0.82$ and 0.90 for the same two samples) while reducing the number of items from 50 to 14 (22).

Higher FPS scores indicate a higher degree of fat phobia. A score above 4.4 (on a scale of 5) is considered to indicate a high level of fat phobia. Neutral or positive views of overweight people are indicated by scores less than 2.5; low fat phobia corresponds to scores of 3.51–3.45 and moderate FPSs of 3.46–4.39 (22). The mean FPS score for the general population is 3.60 ± 0.64 (22) while the mean score for students of dietetic majors has been previously reported as at 3.66 (18) and dietitians as 3.83 ± 0.58 (29).

The FPS was chosen because of its previous use in comparative groups (18,20,22,30–32) and the fact that it measures explicit weight bias that represents conscious bias. The short-form scale was chosen because the 14-item questionnaire is relatively short, reducing burden on participants. To reduce the likelihood that the participants would be aware of the true intentions of the study, the FPS was accompanied by two other psychological instruments.

Because of the explicit bias assessed through the FPS, questions that may imply implicit weight bias in practice were asked accompanying a case study. Participants were asked how much they would enjoy working with this patient on a five-point scale from 'very little' to 'very much'. Participants were asked to rate their client's (a) diet quality, (b) overall health status, (c) energy intake and (d) level of physical activity on a five-point scale from 'very inadequate' to 'excellent'.

The possible dietary recommendations that could be chosen by participants incorporated a mix of commonly suggested strategies for lactose intolerance (33) and overweight and obesity, as outlined in the DAA's Best Practice Guidelines for the treatment of overweight and obesity (34). The recommendations (a) exclude all dairy products, (b) allow lower lactose dairy products, (c) recommend probiotic supplement, (d) replace dairy with dairy alternatives, (e) use lactase treated foods and (f) recommend low GI/GL foods were presented with a five-point scale from 'strongly disagree' to 'strongly agree'. The recommendations (a) body weight, (b) portion sizes, (c) exercise, (d) fibre intake, (e) energy intake, (f) fat intake, (g) carbohydrate intake and (h) protein intake were presented with a five-point scale from 'reduce greatly' to 'increase greatly'.

In addition, participant's perception of their client's future success in weight management was tested. On a five-point scale from 'very well' to 'very poorly', participants were asked to rate how (a) how receptive the patient will be to treatment recommendations, (b) how well their patient understood treatment recommendations, (c) how motivated their client was to change their diet, (d) how successful the client will be in making changes and (e) how successful the patient will be at maintaining these changes.

Procedure

Participants completed an online, anonymous, five-part self-report survey. The initial section (Part A) of the questionnaire asked demographic questions and questions related to dietetic qualifications. Parts B–D included the FPS and two other psychological scales. Between Parts D and E, participants were asked to 'Pick a Box' to allow participants to be randomized into one of two groups. More participants (63.8%) chose the top button, which resulted in them viewing the client within the healthy weight range compared with those (36.2%) who chose the lower button and viewed the client profile accompanied by a photo of a women in the obese weight range. Part E was the case study, and Parts E1, E2 and E3 were questions related to the case study and dietetic practice.

The client case studies were identical, except for the photo that accompanied them. The two photos had a number of visual/physical similarities including style and colour of dress, stance, level of smile, colour of eyes, colour of hair, style of hair in photo and eye glasses. Initially, we attempted to professionally alter images through computer editing software to create a client of two different weight statuses from an original picture of a client in the healthy weight range and from an original picture of a client with obesity. The resulting images did not look authentic, and this has been identified as a barrier in a previous study (35). The pictures were tested in a pilot study and in the post-pilot debriefing; pilot participants believed that the visual differences in the photos were primarily due to weight, which was accompanied by different BMI ratings in the client profiles, where Sally in

the 'obese' weight range had an approximate BMI of 32 kg m^{-2} (Figure. 1) and Sally in the 'healthy' weight range was indicated to have a BMI of approximately 22 kg m^{-2} (Figure 2).

The case study identified that Sally was consulting the dietitian because of lactose intolerance. This condition was chosen because the dietetic management should be the same regardless of weight status (33). A previous study (31) investigating dietitian assessment used lactose intolerance. The food information provided was designed to replicate healthy eating as outlined by the Australian Guide to Healthy Eating for women between 19 and 30 years of age (36). The number of serves consumed from the food groups was at the lower end if a range is recommended. Both case studies indicated exercise between the recommendation of 30 min day^{-1} for health and prevention of disease and 60 to 90 min day^{-1} for weight loss (37). Biochemical and biomedical data commonly collected in chronic disease risk screening were reflective of excellent health, by being within the reference range for each measure (38). The profile of the case study is presented in Table 1.

Figure 1 Picture of female within obese body mass index category accompanying case study.

Results

Respondent attributes

The majority (93%) of participants were women. Participants aged between 26 and 35 years of age were represented by 42.3% (SD = 4.46) of the dietitians in this study. Just over one quarter (26.5%) of participants were aged between 18 and 25; 14.4% participants were aged between 36 and 45; and the remaining 16.8% were older than 46. The average weight and height of participants were 55 kg and 168 cm, respectively. Participant BMI ranged from 17.2 to 36.7, with a mean BMI of 22.43 $\pm$ 2.78 kg m^{-2}, with the majority of participants (69.2%) within the healthy weight range (BMI 20–25 kg m^{-2}) and 16.7% of participants within the underweight range (BMI $<$20 kg m^{-2}).

Sample representativeness

The gender distribution of the study sample was not significantly different than the DAA membership (Chi square goodness of fit, $x^2 = 3.32$, $p = 0.065$) but had a greater representation of younger dietitians (i.e. less than 36 years) than the DAA membership ($x^2 = 670$, $p < 0.001$).

Weight bias

The mean FPS was as 3.37 $\pm$ 0.38 and the vast majority of participants recorded FPS that indicate mild or moderate fat phobia. One (0.5%) participant indicated neutral ($\leq$2.5) fat phobia, and one participant indicated high ($>$4.40) fat phobia. Mild (2.51–3.45) fat phobia was indicated by 114 (56.7%) participants. Moderate (3.46–4.39) fat phobia was indicated by the remaining 85 (42.3%) participants.

Figure 2 Picture of female within healthy weight body mass index category accompanying case study.

Table 1 Profile of case study: Sally Smith (identical information for both pictures)

Demographics	
Age	25
Gender	Female
Occupation	Accountant
Biochemical data (from GP)	
Blood pressure	110/75
TCholesterol	4.2 mmol L^{-1}
HDL cholesterol	1.7 mmol L^{-1}
LDL cholesterol	2.0 mmol L^{-1}
FBGL	5.5 g L^{-1}
Diet History Assessment (core food groups Ax from 24 hr recall)	
Breads and cereals	six serves per day
Fruit	two serves per day
Dairy	three serves per day
Vegetables	five serves per day
Meat and meat alternatives	two serves per day
Exercise (self-reported)	
Brisk walking	1 h day^{-1}
Strength training (gym)	3 h $week^{-1}$

Fat Phobia score was significantly correlated with recommending increasing exercise ($r = 0.159$, $p < 0.05$) and recommending reducing carbohydrate intake ($r = -0.144$, $p < 0.05$). No other items were significantly correlated with FPS. BMI of participants was significantly correlated with only one item. BMI was negatively correlated ($r = -0.140$, $p < 0.05$) with 'How well do you think the patient will understand your treatment recommendations?', and this correlation was statistically significant.

The relationship between dietitians' experience (in terms of graduating year) and their attitude towards people with obesity was examined through the Pearson correlation coefficient. The negative correlation ($r = -0.056$, $p > 0.1$), as reported, indicated that APDs with more years of experience had lower scores on the FPS. However, this relationship was very weak and statistically insignificant. Those with lower BMIs had higher levels of fat phobia ($r = -0.102$, $p > 0.1$); however, this correlation was also weak and significantly insignificant.

Effect of client weight status on dietetic assessment

Overall, the dietitians evaluated both the client with obesity and the client within the healthy weight range as having adequate levels of health generally (indicated by means >4.0 on the 5-point scale). Despite this, dietitians who viewed the client with obesity rated her health significantly lower ($M = 4.08 \pm 0.52$) than those who viewed the client within the healthy weight range ($M = 4.38 \pm 0.54$, $t[199] = -3.99$, $p < .001$).

Mean scores on individual health assessment items (Table 2) were assessed to determine if there were any that were contributing more to this result. Diet quality was rated slightly lower for the client with obesity than

Table 2 Mean scores on individual assessment items within dietetic assessment

Item	Obese client	Healthy weight client	*t*	*p*
Diet quality	4.29 (0.57)	4.41 (0.72)	0.87	>0.05
Health status	3.94 (0.79)	4.42 (0.80)	8.42	<0.001*
Appropriateness of Kilojoule intake	3.69 (0.76)	4.09 (0.66)	7	<0.001*
Adequacy of physical activity	4.39 (0.77)	4.59 (0.59)	1.88	>0.05
n	125	76		

***N* = 201**
Note.
*denotes significant difference

for the client within the healthy weight range; however, this difference was not significant. Similarly, those viewing the client with obesity rated the adequateness of physical activity as slightly lower than those who viewed the client within the healthy weight range, but the difference was not significant. When asked to rate the client's overall health status, participants who viewed the client with obesity rated her as having a significantly lower health status, than those who were presented the client within the healthy weight range. Participants were also more likely to make an assessment that the client's calorie intake was too high if they viewed the client within the obese weight range ($p < 0.001$).

Client weight status and the effect on dietetic recommendations

The type and frequency of recommendations dietitians made were significantly different depending on the client profile they were presented. Participants who viewed the client with obesity profile made significantly more recommendations focussed on weight management compared with those who viewed the client within the healthy weight range. Specifically, they were more likely to recommend reduction in body weight ($p < 0.001$), reduction in portion sizes ($p < 0.001$), increasing exercise ($p < 0.05$), increasing fibre ($p < 0.001$), reducing energy intake ($p < 0.001$), reducing fat intake ($p < 0.001$) and reducing the GI/GL of the diet ($p < 0.05$). In fact, the only recommendation for which there were no significant differences between clients was for changes in protein intake. Table 3 identifies the difference between mean ranks for weight management recommendations between the client in the healthy weight range and client with obesity.

When making dietetic recommendations for lactose intolerance (which is the condition the client was seeking treatment for), dietitians in this study who viewed the picture of the client with obesity were significantly less likely to recommend dairy products such as hard cheese and yoghurt, compared with dietitians who viewed the female within the healthy weight range. However, no significant differences were found in other recommendations for managing lactose intolerance, such as including a probiotic supplement, using lactase-treated foods and allowing low lactose dairy products.

Table 3 Mean rank for wt management recommendations according to client weight status

Recommendation	Obese	Healthy weight	Mann–Whitney U	*Z*
Body weight	73.5	146.23	1,312.5	−9.88**
Portion sizes	78.39	138.18	1,924	−8.34**
Exercise	107.43	90.42	3,946	−3.13*
Fibre intake	109.2	87.52	3,725.5	−3.21**
Energy intake	76.14	141.89	1,642.5	−9.07**
Fat intake	83.36	130.01	2,545	−6.32**
Carbohydrate intake	86.59	124.7	2,949	−5.72**
Recommend low GI/GL foods	98.02	105.89	4,378	−2.48*
Protein intake	108.56	88.57	3,805.5	−1.31
n	125	76		

n = 201.
Note
*denotes $p < .05$
**denotes $p < .001$

Effect of client weight status on dietitian perceptions of client characteristics

Accredited Practising Dietitians who were presented the client profile with the photo of 'Sally' with obesity reported significantly higher levels of anticipated enjoyment in working with that client ($M = 3.98 \pm 0.76$) compared with those presented with 'Sally' in the heathy weight range ($M = 3.45 \pm 0.94$, $t[199] = 4.42$, $p < .001$). While there appeared to be a trend for dietitians to rate the client with obesity as less receptive ($M = 2.09 \pm 0.72$ vs. $M = 2.14 \pm 0.67$), with lower abilities to understand recommendations ($M = 1.93 \pm 0.63$ vs. $M = 1.97 \pm 0.79$), less motivated ($M = 2.07 \pm 0.78$ vs. $M = 2.18 \pm 0.77$), less compliant ($M = 2.19 \pm 0.73$ vs. $M = 2.29 \pm 0.79$), less

successful ($M = 2.21 \pm 0.82$ vs. $M = 2.29 \pm 0.68$) at implementation of recommendations and less able ($M = 2.22 \pm 0.76$ vs. $M = 2.40 \pm 0.77$) to sustain recommendations, these results were not statistically significant $t(199) > 0.05$).

Discussion

Consistent with previous findings (18,22,29,39), the results of this study confirmed the hypothesis that APDs possess weight bias towards people with obesity with almost all participants indicating mild or moderate levels of fat phobia. Comparative studies identify FPS mean in the moderate range, where our study identified a mean within the mild range. Our participants' mean FPS score of 3.36 was lower than the mean FPS scores of 3.7 (31), and 3.66 (18) reported two different samples of the US dietetic students, and FPS scores of 3.45 in a sample of Mexican nutrition students (30) and 3.8 in a sample of UK students (29). In the general US population, the mean FPS score has been cited as 3.6 (31) and 3.83 (29) in two different studies. The differences may be explained by the differences between groups within the studies or show a slight improvement in weight discrimination over the years. Alternatively, it may also identify that APDs are affected by social desirability bias. Like all of the explicit scales measuring weight bias, the FPS is self report and may provide information that does not adequately reflect bias (40). Additionally, the FPS completed consciously, where bias occurs unconsciously, so conscious responses may not adequately reflect the level of an individual's bias.

We found that participants who viewed the client with obesity believed they were more likely to enjoy working with the client. Puhl *et al.* (2009) found no difference in their sample of student dietitians' perceived level of enjoyment in counselling regardless of their weight status (31). Often, dietitians pursue a career in dietetics because of their desire to help other people (41). They also believe that they are the most equipped health professionals to help clients with weight management (25). This may highlight that dietitians may gain job satisfaction from working with clients with obesity. It may also represent a feeling of confidence and competence of working with this client group.

Dietitians in this study were more likely to provide advice aligned with weight management recommendations if they were presented the client case study accompanied by the picture of the client with obesity. In a recent study evaluating how perception of weight stigma impacts doctor–patient relationships, providing unsolicited advice was the most commonly reported stigma situation in health care, affecting up to 19% of participants (42). This may open the client to feeling discriminated against because of her weight, or not listened to, despite being asked to describe what she had consumed over the past 24 h and the information indicating that she lead a healthy lifestyle and had healthy biomarkers. Obesity is multifactorial, and although there are controllable risk factors, there are also risk factors that are out of the client's control (4). Even if the client's obesity is influenced by controllable factors, the client may already be following a weight management programme; she may have recently changed her diet and physical activity habits; and she may have recently lost weight.

Alternatively, the client may always lead a healthy lifestyle and be affected by obesity because of other factors besides food intake or physical activity. This type of unsolicited weight management advice has been shown (16) to dissuade clients who are affected by overweight or obesity from seeking health care, and this could negatively impact clients' health. The client may perceive the focus on weight management advice to be stigmatizing. It could be argued that providing recommendations aimed at weight loss is best practice when a client is affected by obesity, because there are a number of benefits to weight loss (34). However, the client presented for lactose intolerance, and there is no evidence that weight loss will improve the symptoms of or manage lactose intolerance (33). This unsolicited advice may take away from for lactose intolerance, as the client may perceive discrimination. APDs within this study may have made automatic assumptions regarding the dietary intake and exercise behaviours, which did not align with the information provided from the client. It is possible that participants in this study were acting with the best intentions of providing high quality care and believing that the client was 'deserving' of weight loss advice; however, this does not reduce the potential effect that weight bias may have on the client (43). The case study reveals that the client is eating at the lower end of recommendations according to the AGTHE, and therefore, advice to further reduce macronutrient intake as we saw in our study is unwarranted. If the client was deliberately under reporting in their diet history, this implies that the client does not want weight loss advice. Even if the dietitian believed that the client 'deserved' to lose weight, the actions of reducing their dietary intake well below a level that would promote weight loss (the reported diet history would evoke weight loss) may demonstrate weight bias.

Despite APDs assessing both the woman with obesity and the woman within the healthy weight range as having adequate levels of health, the woman affected by obesity received significantly lower health assessments even though patient information was identical. These results were expected because of the plethora of evidence

outlining the health risks to obesity such as increased risk of developing hypertension, type two diabetes, certain cancers, cardiovascular disease, mental health disorders, orthopaedic conditions and overall detrimental effects on morbidity and mortality (34). However, people who are overweight or obese do not necessarily have lower levels of health, and individuals may be obese, yet have no detriments to their health because they lead healthy lifestyles (44), such as described within the case study provided to the participants in this study. These results represent a weight bias of APDs in this sample, and dietitians should be encouraged to assess patients according to their individual lifestyles rather than their weight. In contrast, self-reports can be unreliable, and overweight patients often under report intake and over report physical activity (45). Therefore, APDs may have drawn on their knowledge of under-reporting and the detriments of obesity when making their dietetic assessment.

This study is not without its limitations. One significant limitation is the use of two different people as stimuli. Despite the similarities, there are a number of differences that could be interpreted differently by different participants. The picture of the woman within the healthy weight range has her arms crossed, which is normally associated with being assertive or dominant, whereas the woman with obesity has her arms by her sides, which is normally associated with being submissive (46). Further, the woman within the healthy weight range is holding her head higher (her chin is higher), and she has a bigger smile, which may give the impression of confidence more so than the position of the head and the facial expression of the woman with obesity (46). We attempted to create computer altered images, but were unsuccessful, and the results seemed inauthentic. If a similar study were repeated, we could adopt the method described by O'Brien *et al.* (2008) where they used bariatric surgery patient's pre and post-pictures as stimuli (35).

The results of this study provide insights into weight bias in dietitians and identify that the FPS may not predict the weight bias that occurs in dietetic practice when the dietitian is faced with a client with obesity. Explicit scales such as the FPS may not be representative of weight bias in this group, considering our implicit test using a case study identified weight stigmatizing practices despite the majority of our participants recording only mild fat phobia. The results provide some considerations for dietitians who work with clients with obesity and their supervisors. Changing usual dietetic practice may be warranted in some cases, and each client should be assessed individually to determine whether dietetic assessment is accurate and whether dietetic recommendations are appropriate and resulting in the intended outcomes.

Weight bias can be reduced in health professionals. Tutorials focussing on the uncontrollable risk factors of obesity produced a reduction in implicit and explicit weight bias (47). Phelan *et al.* (2015) identify strategies that may assist practitioners in reducing explicit and implicit weight bias. For example, incorporating perspective-taking exercises to enhance empathy, implementing a zero-tolerance policy for comments and humour that stereotypes client groups, incorporating meditation to foster positive effect regulate negative emotions and enhance positive emotions, promote awareness by having practitioners self-administer explicit (such as FPS) and implicit (such as the Implicit Association Test), focussing less on the weight-related benefits and more on the health benefits of healthy eating and exercise and adopting patient-centred communication styles (43). Cotugna and Mallick (2010) found that dietetic and health promotion students were better able to empathize and showed reduced levels of weight bias after they followed a calorie-restricted diet, similar to what many of their clients would be on for 1 week. Interestingly, 35% of students were unable to comply with the dietary restrictions (48). Research is needed to determine whether these strategies (or others) are effective in reducing weight bias in dietitians. Research such as field experiments observing and/or auditing dietetic practice in response to client weight status or assessing whether and how patient experiences and perceptions of bias affect their physical, psychosocial and psychological outcomes will allow a greater understanding of the extent of the problem and the effects on client outcomes.

Conflicts of Interest Statement

No conflict of interest was declared.

Author contributions

TD and KB conceived the study and developed the research questions. TD collected and analysed the data. All authors contributed to the writing of the article.

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